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(54) A BATTERY POWER PACK

(71) We, WOLF-GERATE GmbH, a Body Corporate organised under the laws of the Federal Republic of Germany, of Gregor-Wolf-Strasse, 5240 Betzdorf, Sieg, Federal Republic of Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a battery power pack for electric motor driven house or garden equipment.

The development of efficient and accordingly lighter rechargeable nickel-cadmium batteries has made it possible to incorporate battery-driven motors in electrically driven house and garden equipment instead of mains-supplied electric motors. This not only takes into account the safety requirement, but also there is the advantage of substantially easier handling since power supply leads are dispensed with. These batteries have furthermore made it possible to design tools which formerly were not suitable for incorporation of mains-supplied motors and therefore were exclusively manually operated as is the case for example with grass shears.

One disadvantage of rechargeable nickel-cadmium batteries lies in their price, which makes up a substantial percentage of the overall costs of such an article of equipment.

An object of the present invention is to create a power pack provided with such batteries, which can be fitted selectively in different articles of equipment and makes the article read for use. The invention is based on the consideration that a house or garden owner often buys the various forms of labour-saving equipment one after the other and that it constitutes a substantial saving in costs if on further purchases he does not have to pay for the batteries, because the power pack or current supply unit required has already been acquired with the first article of equipment purchased and can then be used for all further forms of equipment. A single such power pack or current supply unit is also quite sufficient for most applica-

tions, because as experience has shown in one household several such devices are not used simultaneously or at least there is no urgent need to use them simultaneously.

According to the present invention there is provided a power pack for electric motor driven house or garden equipment comprising an L-shaped battery housing adapted to receive rechargeable batteries and provided at the end of one limb with a guide collar having two external electrical contact terminals and adapted to be slid into and locked in a recess in the equipment, the battery housing being provided at the end of its other limb with an interlocking connection for mechanical connection to the equipment.

The use of a power pack according to the invention makes it possible to achieve an extremely economical use of the batteries, because even when using rechargeable batteries a certain degree of ageing is unavoidable so that a new battery or batteries must be purchased occasionally, but it is not necessary to replace all the batteries individually provided for each single article of powered equipment, since the same power pack is usable with each of the articles.

A further substantial advantage of the preferred embodiments of the invention resides in that the battery charging operation of the power pack can take place within the equipment in which the power pack is installed. Accordingly this avoids injury, on the one hand, which might occur owing to improper switching on of the equipment during the charging operation, and, on the other hand, if in the garden shed or the like no mains or line connection is available, the relevant article of equipment which has become dirty in use does not need to be taken into the house for recharging.

As is apparent the system in accordance with the invention does not constitute a simple replacement of non-rechargeable dry batteries by rechargeable batteries, but is characterised in that a battery power pack is provided which can be inserted as a complete unit in different articles of equipment to make electrical connection therewith.

In accordance with a preferred embodiment of the invention the battery housing is made of plastics material and is so shaped that it forms part of the housing or handle of equipment to which it is fitted.

Thus, in accordance with a preferred embodiment of the invention the housing is constructed as part of a handle, which is completed by the housing part of the equipment, for example garden shears or hedge clippers. For this purpose the interlocking connection is preferably in the form of a dovetail connection engageable with a handle of the equipment.

In what follows embodiments of the invention will be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 shows a diagrammatic side view of a power pack or current supply unit constructed in accordance with the invention;

Figure 2 is a plan view of the power pack in accordance with Figure 1;

Figure 3 is a partly sectioned side view of grass shears with the power pack in accordance with Figures 1 and 2 inserted therein;

Figure 4 is a partial cross sectional view taken on the line IV—IV of Figure 3, on an enlarged scale;

Figure 5 is a partly sectioned side view of hedge clippers adapted to receive a power pack or current supply unit of the present invention, with the power pack removed;

Figure 6 is a side view of a spraying device with a power pack according to the invention inserted;

Figure 7 is a plan view, partly cut away, of the device in accordance with Figure 6, and

Figure 8 is a partly sectioned side view of a barbecue or grill motor adapted to receive a power pack according to the invention, with the power pack removed.

Referring first to Figures 1 and 2 the power pack 10 or current supply unit consists of an L-shaped battery housing 12 made of plastics material with a front guide collar 14 at the end of the long limb and a dovetail guide 16 at the end of the short limb. The housing accommodates five batteries 18 connected in series, the batteries preferably being nickel-cadmium batteries. Four of the batteries 18 are arranged in two pairs with parallel axes alongside each other and in tandem, while the fifth battery 18a is arranged transversely. The series connections, which are not indicated in the drawings, can be effected by soldering or by suitable spring contacts. On the guide collar 14 two contact springs 20 are arranged externally for the purpose of making contact with corresponding contact springs 22 (see Figure 5) in a recess 24 in equipment to be driven by the power pack 10, the collar 14 being a close fit in the recess 24.

The battery housing 12 furthermore has a spring-loaded axially sliding locking knob 26, which snaps into a locking recess 28 of the housing of the equipment to be driven. Reference numeral 30 denotes a charger plug connection.

As can be seen from Figure 4, the dovetail guide 16 of the housing 12 constitutes a means for positive or interlocking engagement with two connecting flanges 32 provided on the housing of the equipment to be driven. In the embodiment shown in Figures 3 and 5 the battery housing 12, which in Figure 5 is not inserted, forms part of the holding handle and simultaneously a means for stiffening the housing of the equipment. In Figures 3 and 5 a drive motor 34 and the switching-on knob 36 of the equipment, and also the contact springs 22, are only shown diagrammatically.

The embodiment of the invention shown in Figures 6 and 7 is a spraying device with an electric motor-driven pump 38. The battery housing 12 in accordance with the invention is in this case inserted under a cover or shroud 40 in a recess 42 of a reservoir 44 for the material to be sprayed. A spraying tube 46 extends through the cover 40 and communicates with the reservoir 44. Reference numeral 48 denotes a filler cap closing an aperture through which the reservoir 44 may be filled.

Figure 8 shows a barbecue 50 with a motor 52 and a receiving bush 24 with the close fit for insertion and locking of the battery housing, which in this case can serve as a carrying handle for the barbecue. The motor 52 drives the barbecue spit connection 54 via step-down drive. A counter-bearing stud 56 engages a fixed support (not shown) for the spit to prevent rotation of the relatively light motor unit.

WHAT WE CLAIM IS:—

1. A power pack for electric motor driven house or garden equipment comprising an L-shaped battery housing adapted to receive rechargeable batteries and provided at the end of one limb with a guide collar having two external electrical contact terminals and adapted to be slid into and locked in a recess in the equipment, the battery housing being provided at the end of its other limb with an interlocking connection for mechanical connection to the equipment.
2. A power pack in accordance with claim 1, in which the battery housing when mounted in the equipment constitutes part of the housing of the equipment.
3. A power pack in accordance with claim 2, in which the battery housing is adapted to form a part of the handle of equipment in the form of grass shears or hedge clippers when fitted thereto.

4. A power pack in accordance with claim 3, in which the interlocking connection comprises a dovetail connection engageable with a handle of the equipment.
- 5 5. A power pack in accordance with any one of claims 1 to 4, in which the guide collar has a spring-loaded locking member which cooperates with a locking hole in the equipment.
- 10 6. A power pack in accordance with any one of claims 1 to 5, in which the housing is adapted to receive five said batteries, of which respectively two pairs are arranged with parallel longitudinal axes alongside each other and in a tandem fashion, while one 15 battery is arranged with its longitudinal axis perpendicular to the axes of the said two pairs of batteries.
- 20 7. A power pack in accordance with any one of claims 1 to 6, in which the guide collar contact terminals cooperate with contact connection springs in the recess of the equipment.
8. A barbecue motor provided with a power pack in accordance with claim 1, in which the guide collar of the battery housing is inserted into a bush of the barbecue motor. 25
9. A spraying device provided with a power pack in accordance with claim 1, in which the guide collar of the battery housing is inserted into a receiving bush of the spraying device. 30
10. A power pack in accordance with claim 1, substantially as herein described, with reference to, and as illustrated in Figures 1 to 4, or Figures 6 and 7, of the accompanying drawings. 35

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Fig. 1

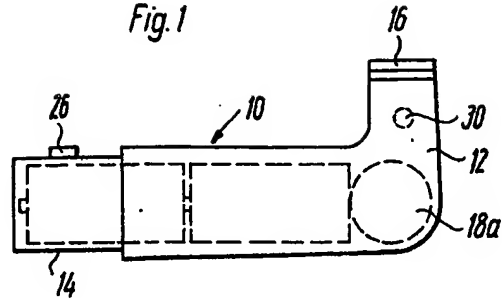
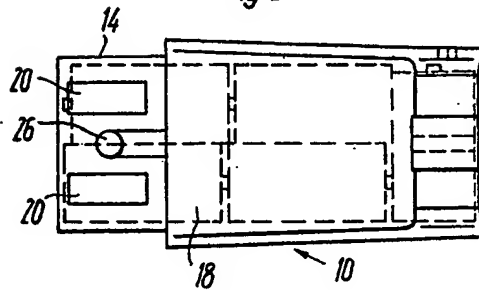


Fig. 2



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COMPLETE SPECIFICATION

4 SHEETS

This drawing is a reproduction of
the Original on a reduced scale

Sheet 2

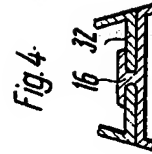
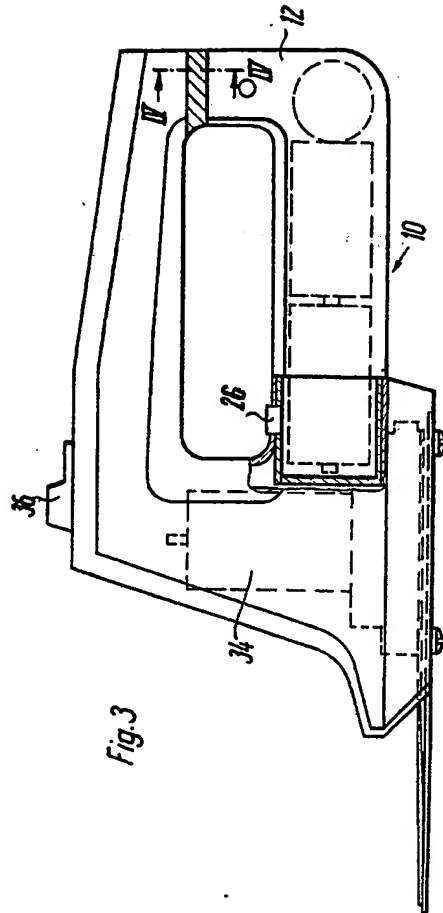


Fig. 5

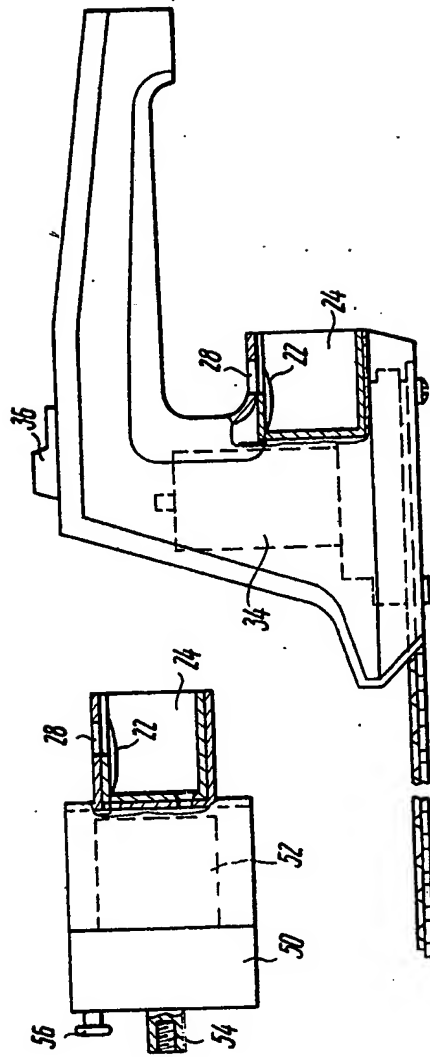


Fig. 8

